

JAN 14 1964
 REG. DIRECTOR
 SECY. TO R.D.
 INFO OFFICER
 MILES MOORE
 ADMM. OFFICERS
 FISH MGT.
 BUDGET & FIN.
 RESEARCH
 LITH. & R. DIV.
 ARTS & CRAFTS
 P. & C.
 FISH MGMT.
 CONSERVATION DIV.
 REALTY
 OVERSEAS
 FEDERAL AID
 ENGRG.
 CREEP-FISH DIV.
 HATCHERIES
 FISH MGT.
 MARLS & FILES
 LIBRARY

Outflow
 (Approx.)

None
 None

Flow
prox)

P. & B. C.
 W. B. BENT.
 CHIEF FISH DIV.
 REALTY
 RIVER BASINS
 FEDERAL AID
 ENGRG.
 CHIEF FISH DIV.
 HATCHERIES
 FISH MGT.
 MARINE & FILE
 LIBRARY

Unit	Gauge Reading	Management Level	Maximum Level	Inflow (Approx.)	Outflow (Approx.)
North	98.75	99.10	100.00	None	None
Center	98.66	97.60	100.00	None	None
South	98.57	97.60	100.00	500 g.p.m.	None
Owens Bay	5.62	5.60	6.50	800 g.p.m.	500 g.p.m.

100-4376

Lake Andes Proper is divided into three units by two dikes. Control structures in these dikes are designed to hold water in the North and South Units which are supported by approximately 63 percent and 23 percent, respectively, of the Lake Andes watershed. Water would pass to the Center Unit only when the North Unit exceeded 99.10 and the South Unit exceeded 97.60. The Center Unit becomes contiguous with the South Unit when it reaches 97.60 and both become contiguous with the North Unit when they reach 99.10. The maximum level, 100.00, is regulated by a control structure on the outlet siphon to the Missouri River.

[illegible]

The attached table presents the water use information for all units during 1963.

The management level of Owens Bay was decreased from 6.30 to 5.60 on April 5. This decrease was as planned and was designed to provide exposed shoreline as territorial space for breeding ducks.

The breeding population of ducks on Owens Bay was estimated at 183 pairs in 1963 as compared to 80 pairs in 1962 and 91 pairs in 1961. Although there was a general increase in breeding ducks in the southern Coteau, much of this increase on Owens Bay is assumed to have been the response to improved breeding habitat which resulted from a reduction in dense emergents and the increase in exposed shoreline.

The high management level, 6.30, on Owens Bay in 1962 and the grazing pressure starting May 15 just after the unit had dropped to the

1963 management level resulted in a reduction of overly dense emergent vegetation (mostly river bulrush) to approximately 20 acres compared to an estimated 90 acres in 1961. The concentration of muskrats into this reduced acreage increased the openings to what is considered near optimum.

The entire area of open water on Owens Bay supported lush stands of submerged aquatics. General observations indicated that sago pondweed was less abundant and that ceratophyllum, elodea, and chara have become dominate in the deeper portions of the unit.

The artesian well delivered approximately 800 g.p.m., or 1,422 acre feet, to the Owens Bay Unit.

Lake Andes proper is supplied only by run-off. Inflow from this source was estimated at only 3,115 acre feet in 1963 and occurred mostly during the spring thaw and two "cloudburst" rains. The light inflow and a prolonged evaporation period lasting from early June through November, resulted in a net increase of approximately one foot in the level of each unit.

Inflow, which was greatest in the North Unit, passed to the Center Unit then into the South Unit in 1963.

All units produced excellent stands of sago pondweed and small beds of emergents, mostly hardstem bulrush, came into the shallow bays. This aquatic vegetation was dense enough to preclude sport boating after late June.

The breeding population of ducks was estimated at 575 pairs on Lake Andes proper. This represented a slight increase, 4 percent, over the 1962 population of 554 pairs; however, it was still approximately 40 percent below the 1961 population of 949 pairs. The relatively stable population is attributed to the high water levels which first occurred in 1962 and created an "open" lake with a consequent lack of suitable breeding habitat.

The production of ducks was approximately 69 percent less than in 1961 and again reflected the lack of suitable brood cover.

There were no problems of botulism or other biological factors in 1963.

C. 1964 Management Program.

The level of Owens Bay will be decreased from 5.6 feet to 4.6 feet in mid-March, or as soon thereafter as any danger from releases increased by run-off have passed. This level will provide for waterfowl breeding territories along exposed shorelines and in openings created by muskrats in the emergents.

Management of Lake Andes proper will depend upon the amount of run-off received. The control of the North Unit will be maintained at 99.10 feet and any additional water will be passed to the Center Unit. The South control will be maintained at 97.60 feet. Any water in excess of the maximum level of 100.00 feet will be passed to the Missouri River.

January 14, 1964

Harvey W. Miller
Harvey W. Miller
Wildlife Biologist

Approved
2-28-64
[Signature]

IMPOUNDMENT DATA - 1963

	North Unit				Center Unit			
	Gauge Reading	Elevation M.S.L.	Surface Acres	Capacity Acre Feet	Gauge Reading	Elevation M.S.L.	Surface Acres	Capacity Acre Feet
January	100.01	11437.26	611	2,690	99.93	11437.18	2317	17,636
February	99.91	11437.16	607	2,629	99.89	11437.14	2313	17,542
March	100.01	11437.26	611	2,690	99.93	11437.18	2316	17,637
April	100.16	11437.41	617	2,783	100.08	11437.33	2330	17,988
May	99.93	11437.18	608	2,642	99.99	11437.24	2322	17,778
June	99.89	11437.14	607	2,619	99.85	11437.10	2309	17,448
July	99.85	11437.10	605	2,593	99.79	11437.04	2306	17,307
August	99.52	11436.77	591	2,397	99.47	11436.72	2275	16,578
September	99.14	11436.39	576	2,176	99.10	11436.35	2242	15,748
October	99.16	11436.41	577	2,187	99.12	11436.37	2243	15,792
November	99.08	11436.33	573	2,154	98.97	11436.22	2230	15,454
December	98.79	11436.04	560	1,993	98.68	11435.93	2203	14,767
Inflow				1,962				1,897
Outflow				1,461				242
	South Unit				Owens Bay Unit			
January	99.82	11437.07	1762	15,843	6.35	11441.87	296	1,137
February	99.79	11437.04	1760	15,790	6.30	11441.82	295	1,133
March	99.98	11437.23	1766	16,120	6.30	11441.82	295	1,133
April	100.06	11437.31	1770	16,265	6.40	11441.92	298	1,150
May	99.94	11437.19	1764	16,050	5.65	11441.17	275	948
June	99.86	11437.11	1761	15,910	5.43	11440.93	267	885
July	99.81	11437.06	1758	15,825	5.58	11441.10	273	929
August	99.46	11436.71	1743	15,218	5.42	11440.94	267	888
September	99.08	11436.33	1726	14,503	5.42	11440.94	267	888
October	99.09	11436.34	1726	14,505	5.54	11441.06	272	918
November	98.96	11436.21	1721	14,342	5.58	11441.10	273	929
December	98.79	11436.04	1715	14,052	5.60	11441.12	274	934
Inflow				1,681				1,422
Outflow				Nil				722

LAKE ANDES NATIONAL WILDLIFE REFUGE
Lake Andes, South Dakota

AMENDMENT NUMBER 1
ANNUAL WATER MANAGEMENT PLAN - 1964

Section C, 1964 Management Program, is amended by adding the following paragraph:

The level of Owens Bay will be increased from 1440.00 (4.6 feet) to 1441.00 (5.6 feet) during the period October through March 15, or until the annual mallard banding program is completed.

JUSTIFICATION: The purpose of the drawdown was to provide waterfowl breeding territories. However, the drawdown has made the Colorado ramp duck trap inoperative because no water is present at the foot of the trap. It is not practical to relocate the trap on the exposed shoreline because of the possibility of fluctuating water levels and the shallow water freezing completely. In order to use cannon net traps, we would have to purchase new nets at approximately \$106.00 each because only large mesh nets are on hand. Thus, the most practical solution is to raise the water level so the ramp trap can be used at the present location.

Peter S. Suich
Peter S. Suich
Refuge Manager

October 7, 1964

approved
10-14-64

ENGINEERING

Regional Supervisor
Branch of Wildlife Refuges

Acting Regional Engineer

February 25, 1964

EH-R Lake Andes
Water Mgmt. Plan

Lake Andes NWR, South Dakota - 1964 Annual Water Management Plan

We have reviewed the subject program and concur in the proposed operation.

Runoff for this time of year is below median and the high levels recently experienced in Lake Andes may have a chance to recede more this year. The levels are about one foot lower than those at the same time last year.

Pool operation proposed may be subject to some modification depending on runoff conditions and due to the need of construction contemplated for this year.

We suggest that the refuge manager go over the area with the engineer that may be assigned to the construction this summer and check the gauge zeros especially the one for the Owens Bay unit. The zero of this gauge should be set to the same elevation as that for the other Lake Andes unit (elevation 1437.25) to avoid confusion in determining lake levels.

We are attaching curves showing area and capacity data for all the Lake Andes units to be sent to the refuge manager. These curves were compiled from various data in our files and if the refuge manager notes any discrepancies regarding these curves, he should inform the Branch of Engineering.

E. B. Stevenson

Attachments

2 extra cc attd.

CWStephan:rj

Stephan
2-25-64

Stevenson
2/25/64

See file
100-1000

LAKE ANDES NATIONAL WILDLIFE REFUGE
Lake Andes, South Dakota

ANNUAL WATER MANAGEMENT PLAN - 1964

A. Existing water supply.

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Center	98.66	97.60	100.00	None	None
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The assumed 0.00 gauge reading for Owens Bay is equivalent to 1435.52 m.s.l. and the assumed 100.00 gauge reading for the main lake is equivalent to 1437.25 m.s.l.

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B. 1963 Water Uses.

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January 14, 1964

Harvey W. Miller
Harvey W. Miller
Wildlife Biologist

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